JUL 30 2009

510(k) Summary of Safety and Effectiveness

K090844

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.

Introduction

According to the requirements of 21 CFR 807.92, the following information provides sufficient detail to understand the basis for a determination of substantial equivalence.

Submitter name, Address, and Contact

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Contact: Marie Lin, Ph.D.
President

Device Name and Classification

Classification Name:	Enzyme immunoassay, Opiates Class II, DJG (91 Toxicology), 21 CFR 862.3650
	Norbuprenorphine calibrators, Class II, DLJ (91 Toxicology), 21 CFR 862.3200
	Norbuprenorphine controls, Class I, LAS (91 Toxicology), 21 CFR 862.3280
Common Name:	Homogeneous Buprenorphine Enzyme Immunoassay
Proprietary Name:	LZI Buprenorphine Enzyme Immunoassay, Norbuprenorphine Drugs of Abuse (DAU) Calibrators Norbuprenorphine Drugs of Abuse (DAU) Controls

Legally Marketed Predicate Device(s)

The LZI Buprenorphine Enzyme Immunoassay (EIA) is substantially equivalent to the LZI Buprenorphine Enzyme Immunoassay, Calibrators and Controls for Beckman Coulter Synchron Systems (k081008) manufactured by Lin-Zhi International, Inc. LZI's Buprenorphine Enzyme Immunoassay is identical or similar to its predicate in terms of intended use, method principle, device components, and clinical performance.

Device Description

The LZI Buprenorphine assay is a homogeneous enzyme immunoassay with ready-to-use liquid reagent. The assay is based on competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PDH) for a fixed amount of antibody in the reagent. Enzyme activity decreases upon binding to the antibody, and the drug concentration in the sample is measured in terms of enzyme activity. In the absence of drug in the sample, buprenorphine-labeled G6PDH conjugate is bound to antibody, and the enzyme activity is inhibited. On the other hand, when free drug is present in the sample, antibody would bind to free drug, the unbound buprenorphine-labeled G6PDH then exhibits its maximal enzyme activity. Active enzyme converts nicotinamide adenine dinucleotide (NAD) to NADH, resulting in an absorbance change that can be measured spectrophotometrically at 340 nm

Intended Use

The Lin-Zhi International (LZI) Buprenorphine Enzyme Immunoassay is intended for the qualitative and semi-quantitative determination of norbuprenorphine (buprenorphine metabolite) in human urine, at a cutoff value of 5 and 10 ng/mL. The assay is designed for professional use with a number of automated clinical chemistry analyzers.

The Norbuprenorphine Drugs of Abuse (DAU) Calibrators are for use as calibrators in the qualitative and semi-quantitative calibration of the Lin-Zhi International (LZI) Buprenorphine Enzyme Immunoassay.

The Norbuprenorphine Drugs of Abuse (DAU) Controls are for use as assayed quality control materials to monitor the precision of the Lin-Zhi International (LZI) Buprenorphine Enzyme Immunoassay.

The assay provides only a preliminary analytical result. A more specific alternative chemical method must be used in order to obtain a confirmed analytical result. Chromatography/mass spectrometry (GC/MS or LC/MS) is the preferred confirmatory method). Clinical consideration and professional judgment should be exercised with any drug of abuse test result, particularly when the preliminary test result is positive.

Comparison to Predicate Device

The LZI Buprenorphine Enzyme Immunoassay is substantially equivalent to the LZI Buprenorphine Enzyme Immunoassay, Calibrators and Controls for Beckman Coulter Synchron Systems, cleared by the FDA under the premarket notification K081008 for its stated intended use.

The following table compares LZI's Buprenorphine Enzyme Immunoassay with the predicate device.

Device Characteristics	**Subject Device** LZI Buprenorphine Enzyme Immunoassay	**Predicate Device (k081008)** LZI Buprenorphine Enzyme Immunoassay for Beckman Coulter® Synchron Systems
Intended Use	The Lin-Zhi International (LZI) Buprenorphine Enzyme Immunoassay is intended for the qualitative and semi-quantitative determination of norbuprenorphine (buprenorphine metabolite) in human urine, at a cutoff value of 5 and 10 ng/mL. The assay is designed for professional use with a number of automated clinical chemistry analyzers. ***This assay provides a rapid screening procedure for determining the presence of norbuprenorphine (buprenorphine metabolite) in urine. The assay provides only a preliminary analytical result. A more specific alternative chemical method must be used in order to obtain a confirmed analytical result. Chromatography/mass spectrometry (GC/MS or LC/MS) is the preferred confirmatory method. Clinical consideration and professional judgement should be exercised with any drug of abuse test result, particularly when the preliminary test result is positive.***	The Lin-Zhi International (LZI) Buprenorphine Enzyme Immunoassay, when used in conjunction with Beckman Coulter® Synchron LX®, CX®, and UniCel® DxC automated clinical system analyzers, is intended for the qualitative and semi-quantitative determination of norbuprenorphine (buprenorphine metabolite) in human urine, at a cutoff value of 10 ng/mL. ***This assay provides a rapid screening procedure for determining the presence of norbuprenorphine (buprenorphine metabolite) in urine. The assay provides only a preliminary analytical result. A more specific alternative chemical method must be used in order to obtain a confirmed analytical result. Chromatography/mass spectrometry (GC/MS or LC/MS) is the preferred confirmatory method. Clinical consideration and professional judgement should be exercised with any drug of abuse test result, particularly when the preliminary test result is positive.***
Analyte	Norbuprenorphine (buprenorphine metabolite)	Norbuprenorphine (buprenorphine metabolite)
Cutoff	5 and 10 ng/ml	10 ng/ml
Matrix	Urine	Urine
Calibrators Level	6 Levels (0, 5, 10, 20, 40, 75 ng/mL)	6 Levels (0, 5, 10, 20, 40, 100 ng/mL)
Controls Level	3 Levels (3 ng/mL, 7 ng/mL, 13 ng/mL)	2 Levels (7 ng/mL, 13 ng/mL)
Storage	2-8°C until expiration date	2-8°C until expiration date

Performance Characteristics Summary:
Hitachi 717 Analyzer:

Precision: Semi-Quantitative, ng/mL

N=88 (ng/mL)	Within Run			Total Precision		
	Mean	SD	% CV	Mean	SD	% CV
Negative	0.5	0.6	116.1	0.5	0.6	121.4
2.5 ng/mL	3.0	0.3	9.5	3.0	0.4	14.4
5.0 ng/mL	5.2	0.3	6.5	5.2	0.5	9.4
7.5 ng/mL	7.7	0.3	4.3	7.7	0.5	6.0
10 ng/mL	10.0	0.4	4.0	10.0	0.5	5.3
12.5 ng/mL	12.1	0.4	3.4	12.1	0.5	4.4
15 ng/mL	14.5	0.6	4.4	14.5	0.8	5.5
17.5 ng/mL	17.0	0.5	3.0	17.0	0.6	3.7
20 ng/mL	19.9	0.7	3.4	19.9	0.8	4.0

Semi-Quantitative Positive/Negative Results:

5 ng/mL Cutoff Result:		Within Run		Total Precision	
Sample Concentration	% of Cutoff	Number of Determination	Immunoassay Result	Number of Determination	Immunoassay Result
0 ng/mL	-100 %	22	22 Negative	88	88 Negative
2.5 ng/mL	-50 %	22	22 Negative	88	88 Negative
5.0 ng/mL	100 %	22	15 POS/7 NEG	88	62 POS/26 NEG
7.5 ng/mL	+50 %	22	22 Positive	88	88 Positive
10.0 ng/mL	+100 %	22	22 Positive	88	88 Positive

10 ng/mL Cutoff Result:		Within Run		Total Precision	
Sample Concentration	% of Cutoff	Number of Determination	Immunoassay Result	Number of Determination	Immunoassay Result
0 ng/mL	-100 %	22	22 Negative	88	88 Negative
2.5 ng/mL	-75 %	22	22 Negative	88	88 Negative
5.0 ng/mL	-50 %	22	22 Negative	88	88 Negative
7.5 ng/mL	-25 %	22	22 Negative	88	88 Negative
10.0 ng/mL	100 %	22	15 POS/7 NEG	88	47 POS/41 NEG
12.5 ng/mL	+25 %	22	22 Positive	88	88 Positive
15.0 ng/mL	+50 %	22	22 Positive	88	88 Positive
17.5 ng/mL	+75 %	22	22 Positive	88	88 Positive
20.0 ng/mL	+100 %	22	22 Positive	88	88 Positive

Precision: Qualitative, mA/min

N=88 (mAmin)	Within Run			Total Precision		
	Mean	SD	% CV	Mean	SD	% CV
Negative	400.9	3.2	0.8	400.9	5.1	1.3
2.5 ng/mL	419.6	2.7	0.6	419.6	4.0	0.9
5.0 ng/mL	439.2	3.2	0.7	439.2	5.0	1.1
7.5 ng/mL	461.2	3.3	0.7	461.2	4.7	1.0
10 ng/mL	479.2	3.2	0.7	479.2	4.5	0.9
12.5 ng/mL	495.4	3.3	0.7	495.4	4.8	1.0
15 ng/mL	511.7	3.3	0.6	511.7	4.6	0.9
17.5 ng/mL	526.8	3.2	0.6	526.8	4.5	0.9
20 ng/mL	540.3	3.5	0.6	540.3	4.5	0.8

Qualitative Positive/Negative Results:

5 ng/mL Cutoff Result:		Within Run		Total Precision	
Sample Concentration	% of Cutoff	Number of Determination	Immunoassay Result	Number of Determination	Immunoassay Result
0 ng/mL	-100 %	22	22 Negative	88	88 Negative
2.5 ng/mL	-50 %	22	22 Negative	88	88 Negative
5.0 ng/mL	100 %	22	9 POS/13 NEG	88	43 POS/45 NEG
7.5 ng/mL	+50 %	22	22 Positive	88	88 Positive
10.0 ng/mL	+100 %	22	22 Positive	88	88 Positive

10 ng/mL Cutoff Result:		Within Run		Total Precision	
Sample Concentration	% of Cutoff	Number of Determination	Immunoassay Result	Number of Determination	Immunoassay Result
0 ng/mL	-100 %	22	22 Negative	88	88 Negative
2.5 ng/mL	-75 %	22	22 Negative	88	88 Negative
5.0 ng/mL	-50 %	22	22 Negative	88	88 Negative
7.5 ng/mL	-25 %	22	22 Negative	88	88 Negative
10.0 ng/mL	100 %	22	18 POS/4 NEG	88	59 POS/29 NEG
12.5 ng/mL	+25 %	22	22 Positive	88	88 Positive
15.0 ng/mL	+50 %	22	22 Positive	88	88 Positive
17.5 ng/mL	+75 %	22	22 Positive	88	88 Positive
20.0 ng/mL	+100 %	22	22 Positive	88	88 Positive

Detection Limit:

The lowest concentration that can be differentiated from the negative urine with 95% confidence is determined as 2 ng/mL.

Linearity:

Hitachi 717 Instrument: 2-70 ng/mL

When comparing the result (y) and target (x) value, using the least squares regression technique, the regression equation and correlation are as follow:

$y=1.0026x + 0.9053$, $r^2=0.991$

Method comparison against GC/MS confirmation device:
90 clinical unaltered samples:

5 ng/mL Cutoff
(96.4 % agreement with positive, 100.0 % agreement with negative samples)

10 ng/mL Cutoff
(95.1 % agreement with positive, 98.0 % agreement with negative samples)

Specificity and Endogenous Substances:
No significant undesired cross reactants or endogenous substance interference were observed. See product insert for list of compounds tested.

Summary:

The information provided in this pre-market notification demonstrates that the LZI Buprenorphine Enzyme Immunoassay is substantially equivalent to the legally marketed predicated device for its general intended use. Substantial equivalence was demonstrated through comparison of intended use and physical properties to the commercially available predicate device as confirmed by gas chromatography/mass spectrometry, an independent analytical method. The information supplied in this pre-market notification provides reasonable assurance that the LZI Buprenorphine Enzyme Immunoassay is safe and effective for its stated intended use.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
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c/o Dr. Marie Lin
President
687 North Pastoria Avenue
Sunnyvale, CA 94085

JUL 30 2009

Re: k090844
Trade Name: Buprenorphine Enzyme Immunoassay, Opiates, Norbuprenorphine Drug of Abuse Calibrators, Norbuprenorphine Drugs of Abuse Controls
Regulation Number: 21 CFR §862.3650
Regulation Name: Opiate Test System
Regulatory Class: Class II
Product Codes: DJG, DLJ, LAS
Dated: June 18, 2009
Received: June 19, 2009

Dear Dr. Lin:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820).

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding postmarket surveillance, please contact CDRH's Office of Surveillance and Biometric's (OSB's) Division of Postmarket Surveillance at (301) 796-5760. For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-5680 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Courtney C. Harper, Ph.D.
Acting Director
Division of Chemistry and Toxicology
Office of *In Vitro* Diagnostic Device
Evaluation and Safety
Center for Devices and Radiological Health

Enclosure

Premarket Notification Indications for Use Statement

510(k) Number (if known): k090844

Device Name: Buprenorphine Enzyme Immunoassay Norbuprenorphine Calibrators and Controls

Indications For Use:

The Lin-Zhi International (LZI) Buprenorphine Enzyme Immunoassay is intended for the qualitative and semi-quantitative determination of norbuprenorphine (buprenorphine metabolite) in human urine, at a cutoff value of 5 and 10 ng/mL. The assay is designed for prescription use in clinics and clinical chemistry laboratories with a number of automated clinical chemistry analyzers.

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Prescription Use __√__ AND/OR Over-The-Counter Use _____
(Part 21 CFR 801 Subpart D) (21 CFR 807 Subpart C)

Concurrence of CDRH, Office of In Vitro Diagnostic Devices (OIVD) (Per 21 CFR 801.109)

Division Sign-Off

Office of In Vitro Diagnostic
Device Evaluation and Safety

510(k) k090844